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NOV 2 0 2006 POTION

OTICE OF ALLOWANCE AND FEE(S) DUE

EXAMINER

EWALD, MARIA VERONICA

ART UNIT

PAPER NUMBER

1722

DATE MAILED: 11/07/2006

Thomas R. FitzGerald, Esq. Suite 210 16 E. Main Street Rochester, NY 14614-1803

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807.690	03/24/2004	Seon Tae Kim	20010.000600/WA-411/US	4404

TITLE OF INVENTION: EXPANSION TUBE HAVING EXPANSION SLITS AND APPARATUS FOR MANUFACTURING HEAT SHRINKABLE TUBE HAVING THE EXPANSION TUBE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1400	\$300	\$0 ·	\$1700	02/07/2007

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE

#### **HOW TO REPLY TO THIS NOTICE:**

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

- A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.
- B. If the status above is to be removed, check box 5b on Part B Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

- A. Pay TOTAL FEE(S) DUE shown above, or
- B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

### PART B - FEE(S) TRANSMITTAL

NOV	2 0 2006		P. Al or <u>Fax</u> (5	ommissioner for P O. Box 1450  exandria, Virginia 71)-273-2885	atents a 22313-1450	
INSTRUCTIONS. This appropriate. All fother indicated unless control maintenance fee notifical	form should be used for correspondence including the correspondence including the correspondence of the corres	or transmitting the ISSI ig the Patent, advance of terwise in Block 1, by (	UE FEE and PUBLICAT rders and notification of a) specifying a new corre	TION FEE (if required) maintenance fees will espondence address; and	b. Blocks 1 through 5 spe mailed to the current for (b) indicating a separate	hould be completed where correspondence address as arate "FEE ADDRESS" for
CURRENT CORRESPONDE	ENCE ADDRESS (Note: Use Bl	ock 1 for any change of address)	Fee par	e(s) Transmittal. This ce	rtificate cannot be used f per, such as an assignme	or domestic mailings of the for any other accompanying ant or formal drawing, must
Thomas R. Fitz Suite 210 16 E. Main Stree	et ·	/2006	I h Ste ade tra	Certific ereby certify that this Fo tes Postal Service with dressed to the Mail Ston nsmitted to the USPTO (	ate of Mailing or Trans ee(s) Transmittal is being sufficient postage for fire op ISSUE FEE address (571) 273-2885, on the d	mission g deposited with the United st class mail in an envelope above, or being facsimile late indicated below.
Rochester, NY 1	4614-1803			·		(Depositor's name)
	_					(Signature)
						(Date)
APPLICATION NO.	. FILING DATE		FIRST NAMED INVENTO	R AT	TORNEY DOCKET NO.	CONFIRMATION NO.
10/807,690 TITLE OF INVENTION TUBE HAVING THE EX		HAVING EXPANSION	Seon Tae Kim  N SLITS AND APPARA		10.000600/WA-411/US CTURING HEAT SHRI	4404 NKABLE
ĄPPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FE	E TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	<sup>:</sup> \$1400	\$300	\$0	\$1700 <sup>-</sup>	02/07/2007
EXAM	INER	ART UNIT	CLASS-SUBCLASS	]		
EWALD, MARI	IA VERONICA	1722	425-392000			·
Address form PTO/SE  "Fee Address" indi	ondence address (or Cha	nge of Correspondence	or agents OR, alternat (2) the name of a sing registered attorney or	o 3 registered patent attively, gle firm (having as a mer agent) and the names o	mber a 2	
PLEASE NOTE: Unl	ess an assignee is identi h in 37 CFR 3.11. Comp	fied below, no assignee	THE PATENT (print or ty data will appear on the part of the part o	patent. If an assignee is assignment.		ocument has been filed for
Please check the appropri	iate assignee category or	categories (will not be pr	rinted on the patent):	Individual Corpor	ration or other private gro	oup entity Government
	are submitted:  So small entity discount p	ermitted)	b. Payment of Fee(s): (Ple A check is enclosed. Payment by credit ca The Director is hereb overpayment, to Dep	ard. Form PTO-2038 is a	attached.	shown above)  ficiency, or credit any n extra copy of this form).
	s SMALL ENTITY statu	s. See 37 CFR 1.27.	☐ b. Applicant is no lor	nger claiming SMALL E	NTITY status. See 37 Cl	FR 1.27(g)(2).
NOTE: The Issue Fee and interest as shown by the	d Publication Fee (if requeecords of the United Sta	iired) will not be accepte tes Patent and Trademark	d from anyone other than Office.	the applicant; a registere	ed attorney or agent; or th	ne assignee or other party in
Authorized Signature				Date		
Typed or printed name	e			Registration No	<u>-</u>	· .
Alexandria, Virginia 223	13-1430.		on is required to obtain or 1.14. This collection is estated to the collection of th			by the USPTO to process) g gathering, preparing, and ne you require to complete artment of Commerce, P.O. for Patents, P.O. Box 1450, number.



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- 10/807,690	03/24/2004	Seon Tae Kim	20010.000600/WA-411/US	4404	
75	90 11/07/2006		EXAM	NER	
Thomas R. FitzGerald, Esq.			EWALD, MARIA VERONICA		
Suite 210	/	O' To	ART UNIT	PAPER NUMBER	
16 E. Main Street Rochester, NY 146	\_	NOV 2 0 2006 W	DATE MAILED: 11/07/2006	; ,	

## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 376 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 376 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

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TIPE	Application No.	Applicant(s)
Notice of Allemahilike	10/807,690	KIM ET AL.
Notice of Allowability	ఈ ∖ Examiner	Art Unit
NOV 2 0 2006	Maria Veronica D. Ewald	1722
The MAILING DATE of this continuication.  All claims being allowable, PROSECUTION ON THE MERI'S herewith (or previously mailed), a Notice of Allowance (PTOL-8 NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT of the Office or upon petition by the applicant. See 37 CFR 1.3	IS (OR REMAINS) CLOSED in this ap 35) or other appropriate communication RIGHTS. This application is subject to	plication. If not included will be mailed in due course. <b>THIS</b>
1. This communication is responsive to <u>9/14/06</u> .		
2. The allowed claim(s) is/are <u>1,2,5-7,9,12-15 and 17-22</u> .		
3. ⊠ Acknowledgment is made of a claim for foreign priority  a) ⊠ All b) ☐ Some* c) ☐ None of the:  1. ⊠ Certified copies of the priority documents ha		
Certified copies of the priority documents have		
•		
3. Copies of the certified copies of the priority	documents have been received in this	national stage application from the
International Bureau (PCT Rule 17.2(a)).		
* Certified copies not received:		•
Applicant has THREE MONTHS FROM THE "MAILING DAT noted below. Failure to timely comply will result in ABANDOI THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.	E" of this communication to file a reply NMENT of this application.	complying with the requirements
4. A SUBSTITUTE OATH OR DECLARATION must be sul INFORMAL PATENT APPLICATION (PTO-152) which g	bmitted. Note the attached EXAMINER gives reason(s) why the oath or declara	'S AMENDMENT or NOTICE OF ation is deficient.
5. CORRECTED DRAWINGS ( as "replacement sheets") n	nust be submitted.	
(a) ☐ including changes required by the Notice of Draftsp		-948) attached
1) hereto or 2) to Paper No./Mail Date		•
(b) ☐ including changes required by the attached Examin Paper No./Mail Date	er's Amendment / Comment or in the C	Office action of
Identifying indicia such as the application number (see 37 CF) each sheet. Replacement sheet(s) should be labeled as such	R 1.84(c)) should be written on the drawi in the header according to 37 CFR 1.121(	ngs in the front (not the back) of d).
6. DEPOSIT OF and/or INFORMATION about the de attached Examiner's comment regarding REQUIREMEN	posit of BIOLOGICAL MATERIAL : IT FOR THE DEPOSIT OF BIOLOGIC	must be submitted. Note the AL MATERIAL.
		·
Attack mark (a)		
Attachment(s)  1. Notice of References Cited (PTO-892)	5. Notice of Informal F	Patent Application
2. Notice of Draftperson's Patent Drawing Review (PTO-946	<u> </u>	
<del>-</del>	Paper No./Mail Da	te
Information Disclosure Statements (PTO/SB/08),     Paper No./Mail Date	7. 🗌 Examiner's Amendi	ment/Comment
4. Examiner's Comment Regarding Requirement for Depos	it 8. ⊠ Examiner's Stateme	ent of Reasons for Allowance
of Biological Material		
	9.  Other	
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#### Allowable Subject Matter

Claims 1 - 2, 5 - 7, 9, 12 - 15, 17 - 22 are allowed. The following is an examiner's statement of reasons for allowance: With respect to independent claim 1, Applicant has amended claim 1 to state that the plurality of expansion slits have lengths gradually increased along a direction to which the heat shrinkable tube is manufactured, wherein each of the plurality of expansion slits has a larger length in a range of 2.5 times to 5 times than the width thereof in an expansion section and a larger length in a range of 3.5 times to 10 times than the width thereof in a cooling section. Applicant persuasively argued that the closest prior art references of Reifenhauser (U.S. 3,990,828) and Mahoney, et al. (U.S. 6,863,856) both fail to teach expansion tubes wherein the expansion slits have lengths gradually increased along a direction to which the heat shrinkable tube is manufactured. Examiner agrees. With respect to the reference of Reifenhauser, Reifenhauser teaches a plurality of equally-sized, angularly equispaced and longitudinally extending slits; however, the slits do not have lengths gradually increased along a direction to which the heat shrinkable tube is manufactured. With respect to the reference of Mahoney, et al., Mahoney, et al. teach an expansion tube with equally-spaced, longitudinal slits that can be sized according to the user's needs, as shorter rectangular slits, longer slits or as holes; however, the slits are equally-sized along the tube's periphery and do not have lengths gradually increased along a direction to which the heat shrinkable tube is manufactured.

With respect to independent claim 12, Applicant has amended claim 12 to state that the interval of the adjacent left and right expansion slits is the width or less of each

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expansion slit with respect to the inner peripheral surface of the expansion tube. Furthermore, Applicant has argued that Aoshima, Lehtinen and Mahoney, et al. do not teach that there are cooling nozzles transporting water from the cooling water pump to the expansion tube and that all three references do not teach that the gap between slits is the width or less of the expansion slit. Examiner agrees. With respect to the reference of Aoshima (U.S. 5,071,886), Aoshima teaches a cooling bath but is silent with respect to a cooling water pump and cooling nozzles. With respect to the reference of Lehtinen (U.S. 5,516,270), Lehtinen teach an expansion tube with a series of cooling water channels or slits on the inner peripheral surface of the tube, which is surrounded by a sleeve, the outer periphery of which contains grooves configured circumferentially. These circumferential grooves form a lubricating channel system. In addition, Lehtinen does not teach that the cooling water is circulated or delivered to the tube via cooling nozzles, the tube's channels circulate the water and do not utilize any cooling nozzles. Lehtinen also does not teach that the expansion slits on the inner periphery are spaced such that the width between them is less than or equal to the slit width. With respect to the reference of Mahoney, et al., Mahoney, et al. also do not teach that the width between the expansion slits is less than or equal to the slit width, with respect to the inner peripheral surface of the expansion tube.

Thus, prior art fails to teach the following: an expansion tube having a plurality of expansion slits formed along a longitudinal direction on the outer peripheral surface thereof, each of the expansion slits having a predetermined width and a relatively larger length than the predetermined width; wherein the plurality of expansion slits have

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lengths gradually increased along a direction to which the heat shrinkable tube is manufactured; and wherein each of the plurality of expansion slits has a larger length in a range of 2.5 times to 5 times than the width thereof in an expansion section and a larger length in a range of 3.5 times to 10 times than the width thereof in a cooling section. Furthermore, prior art fails to teach: an apparatus for manufacturing a heat shrinkable tube, having an expansion tube, comprising: a denser that is adapted to receive a heat shrinkable tube, while preventing the heat shrinkable tube from being loose; dry heating rolls that are adapted to heat the heat shrinkable tube ejected from the denser; an expansion chamber that is adapted to expand the heat shrinkable tube ejected from the dry heating rolls; a caterpillar that is adapted to have the heat shrinkable tube constant in diameter; and a bobbin that is adapted to wind the heat shrinkable tube ejected from the caterpillar, wherein the expansion chamber comprises the expansion tube in which the heat shrinkable tube is expanded to predetermined radius, a vacuum pump for discharging the air in the expansion tube, a cooling water pump for supplying cooling water to the expansion tube, a plurality of cooling water nozzles for spraying cooling water supplied from the cooling water pump, and a vacuum suction hole disposed between the wall surface of a body of the expansion chamber and the vacuum pump, for discharging the air in the expansion tube to the outside of the expansion chamber, and wherein the expansion tube has a plurality of expansion slits formed on the outer peripheral surface thereof along a longitudinal direction, each of the expansion slits having a predetermined width and a relatively larger length than the predetermined width; wherein an interval of the adjacent left and right expansion slits is

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the width or less of each expansion slit with respect to the inner peripheral surface of the expansion tube.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

#### Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Veronica D. Ewald whose telephone number is 571-272-8519. The examiner can normally be reached on M-F, 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

**MVE** 

JOSEPH S. DEL SOLE

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10/24/06

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U.S. DEPARTMENT OF COMMERCE U.S. Patent and Trademark Office

# NOTICE OF DRAFTSPERSON'S PATENT DRAWING REVIEW

<ul> <li>A.</li></ul>	4 or 1.152 for the reasons indicated below. Corrected
1. DRAWINGS. 37 CFR 1.84(a): Acceptable categories of drawings: Black ink or Color (3 sets required).  Color drawings are not acceptable until petition is granted. Fig(s)  Pencil and non black ink not permitted. Fig(s)  Pencil and non black ink not permitted. Fig(s)  PhotOGRAPHS. 37 CFR 1.84(b)  One (1) full-tone set is required. Fig(s)  Photographs may not be mounted. 37 CFR 1.84(e)  Photographs must meet paper size requirements of 37 CFR 1.84(f). Fig(s)  Poor quality (half-tone). Fig(s)  3. TYPE OF PAPER. 37 CFR 1.84(e)  Paper not flexible, strong, white, and durable. Fig(s)  Erasures, alterations, overwritings. interlineations, folds, copy machine marks not accepted. Fig(s)  4. SIZE OF PAPER. 37 CFR 1.84(f): Acceptable sizes:  21.0 cm by 29.7 cm (DIN size A4) or 21.6 cm by 27.9 cm (8 1/2x 11 inches)  All drawing sheets not the same size. Sheet(s)  Drawings sheets not an acceptable size. Fig(s)  5. MARGINS. 37 CFR 1.84(g): Acceptable margins:  Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm  Margins not acceptable. Fig(s)  Top (T)  Left (L)  Right (R)  Bottom (B)  6. VIEWS. 37 CFR 1.84(h)  REMINDER: Specification may require revision to correspond to drawing changes, e.g., if Fig. 1 is changed to Fig. 1A, Fig 1B and Fig. 1C, etc., the specification, at the Brief Description of the Drawings, must likewise be changed.  Views not labeled separately or properly.  Fig(s)  7. SECTIONAL VIEWS. 37 CFR 1.84(h)(3)  Sectional designation should be noted with Arabic or Roman numbers. Fig(s)	8. ARRANGEMENT OF VIEWS. 37 CFR 1.84(i)  Words do not appear on a horizontal, left-to-right fashion when page is either upright or turned so that the top becomes the right side, except for graphs. Fig(s)  9. SCALE. 37 CFR 1.84(k)  Scale not large enough to show mechanism without crowding when drawing is reduced in size to two-thirds in reproduction.  Fig(s)  10. CHARACTER OF LINES, NUMBERS, & LETTERS. 37 CFR 1.84(l)  Lines, numbers & letters not uniformly thick and well defined, clean, durable, and black (poor line quality). Fig(s)  11. SHADING. 37 CFR 1.84(m)  Solid black areas pale. Fig(s)  Solid black shading not permitted. Fig(s)  12. NUMBERS, LETTERS, & REFERENCE  CHARACTERS. 37 CFR 1.84(p)  Numbers and reference characters not plain and legible. Fig(s)  Figure legends are poor. Fig(s)  Numbers and reference characters not oriented in the same direction as the view. 37 CFR 1.84(p)(Fig(s))  English alphabet not used. 37 CFR 1.84(p)(2)  Fig(s)  Numbers, letters and reference characters must be at least 32 cm (1/8 inch) in height. 37 CFR 1.84(p)(3). Fig(s)  13. LEAD LINES. 37 CFR 1.84(q)  Lead lines missing. Fig(s)  14. NUMBERING OF SHEETS OF DRAWINGS. 37 CFR 1.84(t)  Sheets not numbered consecutively, and in Arabic numbers beginning with number 1. Sheet(s)  15. NUMBERING OF VIEWS. 37 CFR 1.84(u)  Views not numbered consecutively, and in Arabic numbers beginning with number 1. Fig(s)  16. DESIGN DRAWINGS. 37 CFR 1.152  Surface shading shown not appropriate.  Fig(s)  Solid black surface shading is not permitted except when used to represent the color black as well as color contrast. Fig(s)
ewer SON LAM	Date 10/25/2006

